Historic, archived document

Do not assume content reflects current scientific knowledge, policies, or practices.

1
P69c
Cop. 2

U. S. Dept. of Agriculture

Issued August 5, 1912.

U. S. DEPARTMENT OF AGRICULTURE.

BUREAU OF PLANT INDUSTRY—Circular No. 94.

B. T. GALLOWAY, Chief of Bureau.

THE MANGUM TERRACE IN ITS RELATION TO EFFICIENT FARM MANAGEMENT.

BY

J. S. CATES,

Assistant Agriculturist, Office of Farm Management.

42223°—Cir. 94—12

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1912

BUREAU OF PLANT INDUSTRY.

Chief of Bureau, BEVERLY T. GALLOWAY.
Assistant Chief of Bureau, WILLIAM A. TAYLOR.
Editor, J. E. ROCKWELL.
Chief Clerk, JAMES E. JONES.

B. P. I.—742.

THE MANGUM TERRACE IN ITS RELATION TO EFFICIENT FARM MANAGEMENT.

INTRODUCTION.

The terrace problem is an extremely important one in the Southern States. Where there is any considerable slope it is necessary to have some sort of ditch or terrace system to carry off the water in such a way as to prevent erosion of the soil. Many of the systems now in vogue are entirely satisfactory with reference to the removal of surplus water without erosion, but frequently fail to meet the needs of a commercial system of agriculture where it is essential to use modern machinery. The Mangum terrace, as worked out by P. H. Mangum, of Wake Forest, N. C., many years ago, admirably meets the requirements of the farm for modern machinery equipment. Since this is one of the factors of vital importance in efficient farm management in the South, it is believed that a description of it may have wide interest at this time.

UNDESIRABLE FEATURES OF CERTAIN TERRACE SYSTEMS.

Among the undesirable features of many of the terrace systems commonly used in the South at the present time may be mentioned: (1) The waste of land occupied by terrace banks; (2) the increased labor cost by plowing the land in small stretches and by cultivating on contour lines with frequent short rows[1] (it has been shown that in one case a saving in cost of 70 per cent in hoeing and 20 per cent in cultivating was effected by abolishing the old contour system); and (3) the large crop of weeds and grass seeds produced on the old-style terrace bank and also the insects harbored, particularly in boll-weevil sections. (Fig. 1.)

Where 1-horse implements are mainly used and the farms are of such size as not to warrant the use of a more extensive type of machinery, the fact that the terrace bank is not to be plowed across or that the whole field must be worked in contours, necessitating short rows between the terraces, may not be such a very serious hindrance; but where gang plows, section harrows, and riding cultivators

[1] See Farmers' Bulletin 310, U. S. Dept. of Agriculture, entitled "A Successful Alabama Diversification Farm," p. 24.

are to be used, a system of terracing whereby it is possible to plow across fields of medium slope regardless of terrace banks is highly desirable. This point can not be too strongly emphasized, and its importance to southern farms can hardly be exaggerated. The Mangum terrace system permits cultivation of the entire field. With this system in more general use, millions of acres could be cultivated with 2-row cultivators where under many of the systems of terracing at present it is possible to use only a 1-horse outfit, and even then do unsatisfactory work.

ADAPTATION OF MANGUM SYSTEM TO SOUTHERN CONDITIONS.

As before noted, the system of terracing here described was originated and has been in use on the Mangum farm at Wake Forest,

FIG. 1.—The old-style terrace system—land wasting, labor wasting, and pest breeding.

N. C., for about 30 years, during which period it has given entire satisfaction. It is now found in use from the upper Coastal Plain in North Carolina far into the mountain region in the western part of the State. It is not, however, universally practiced between these points.

The Mangum terrace is simple in construction, permanent in character, and lends itself easily to the use of modern labor-saving machinery. The system has been sufficiently tried to thoroughly demonstrate its merits and practicability under a wide range of conditions. It is a system which should be known and practiced not only throughout much of North Carolina but in regions of similar topography and climatic conditions in the other Southern States. The use of the Mangum terrace becomes all the more a matter of general interest when it is recalled that the future use of labor-

saving machinery is in a great measure dependent upon the cultivation of southern lands in larger and less irregular bodies. In this system, where the land has only a medium slope, it is perfectly feasible to cultivate directly over the terrace on a line with the greatest level of the field. This one feature saves a very large amount of labor.

HOW TO LAY OFF AND CONSTRUCT THE MANGUM TERRACE.

The terrace as developed and recommended by Mr. Mangum is laid off on a uniform grade of 1½ inches to 14 feet. This is a slightly higher grade than is usually given a terrace. In many hundreds of actual tests, however, it has been found to give entire satisfaction. The reasons why a grade higher than usual may be permitted are (1) that the water is spread over a broad flat surface instead of confined to a narrow channel and (2) that as the whole area is cultivated the soil is kept roughened, which impedes the velocity of the water. On some soils, however, even a higher grade may be used, while on very light, sandy soils probably a lower grade would be more satisfactory.

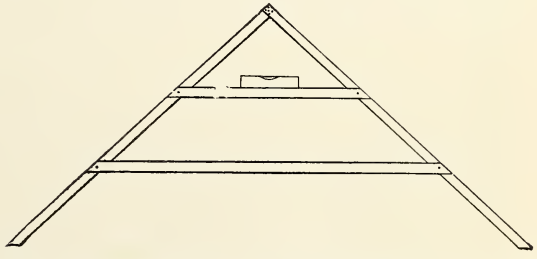

FIG. 2.—A-shaped frame level for laying off the terrace line.

A level for laying off these lines can be constructed on any farm. Make a big letter **A**, 14 feet across the base. (See fig. 2.) On the bar across the apex of the letter **A**, one end of which bar is fastened with one nail, place an ordinary farm spirit level. Set up on an absolutely level surface. Get a little block, 1½ inches high, and put it under one of the feet of the **A**-frame. Adjust the loose end of the crosspiece until the level-bubble remains in the center; then fasten the loose end of the crossbar upon which the level rests.

Now, get a bundle of broom-sedge straw or other material suitable for use in marking out the line of the terrace and start across the field to lay out a line with the desired fall. In going up the grade always keep to the front the end of the letter **A** which rested on the block. Stick a broom straw as a marker where you start at the side of the field and adjust the front end of the **A**-frame by moving it from side to side until the bubble is in the middle of the level. Put the rear end then where the front end was, and continue the process across the field, sticking a broom straw at each point. This marks out the grade line.

When the line is laid out, the terrace can be constructed in any one of several ways. In many cases the most convenient way is shown in figure 3. This figure shows the first steps taken toward constructing the terrace after a line has been laid out. With a 2-horse plow, a backfurrow strip about 15 feet wide, centering on this line of broom straws, has been thrown up. When the ground has settled after a rain the backfurrowing process is repeated. If there is not sufficient time to wait for a rain, the upper side of the ridge can be thrown across on the lower side with shovels. In this way

FIG. 3.—The first steps in constructing a Mangum terrace. A backfurrowing area centers along the grade line.

the terrace is constructed. It should be carefully watched the first year, for it takes several years to build up a thoroughly strong and reliable terrace bank. The next year the terrace is backfurrowed again, and this is continued from year to year until the desired height is reached. The proper height will depend upon the slope of the land, the steeper slopes requiring higher banks.

These terrace lines are usually laid off at intervals of about 6 feet of fall in the slopes of the land. This would make them come on very steep land sometimes 20 to 30 steps apart and on very slightly sloping land 50 to 75 steps apart.

OTHER METHODS OF CONSTRUCTING THE TERRACE.

Figure 4 shows a terrace bank thrown up with a road scraper. This should be gone over with the plow and smoothed down so that the upper side of the terrace will present a broad, flat surface instead of a sharp depression in the ground, bearing in mind that the purpose of the Mangum terrace is to conduct the water off in a wide stream so as to prevent erosion.

FIG. 4.—Terrace bank thrown up with a road scraper. The sharp depression on the upper side will be eliminated when the area is plowed over, and the water will then spread over a broader surface.

Figure 5 shows the first steps in constructing a terrace with a road scraper by simply scraping the dirt down hill. This is to be gone over next with a plow, making the lower side of the present bank the center of backfurrowing.

Figures 6 and 7 show fields in which the rows run directly over the terrace.

Figure 8 shows a cultivator crossing the terrace.

Figure 9 shows the adaptability of the Mangum terrace to permanent pasture lands.

FIG. 5.—The first step in making a terrace with a road scraper when only the upper side is scraped. The lower side will be made the center of the backfurrowing area, 15 or 20 feet wide.

FIG. 6.—View of the completed terrace system in a field near Raleigh, N. C. The gently sloping land makes necessary only small terrace banks. The rows run across the field in line of greatest level, regardless of the terrace.

FIG. 7.—A large field of considerable slope in Wake County, N. C., where the rows cross the terrace bank.

FIG. 8.—One of the original terraces on the Mangum farm in Wake County, N. C.

CARE OF THE TERRACE.

On breaking land which has been terraced in this manner, the terrace can be entirely disregarded in fields of ordinary slope. On such fields, where the terrace is plowed across in breaking, care must be taken to fill up all dead furrows which may cut the terrace bank. This bank should also be made the center of a backfurrow strip of plowing before a crop is planted.

On extremely steep lands the plowing is done in contours, and the area included from the crest of one terrace to the crest of the next is plowed as one body.

FIG. 9.—The Mangum terrace on steep pasture land. When covered with sod this terrace will last indefinitely with little or no attention.

SUMMARY.

The Mangum terrace is a broad bank of earth contouring the field at a grade of approximately 1½ inches to 14 feet. It can be constructed in several ways. Under ordinary farm conditions the most practical way is by backfurrowing along the grade line.

This system of terracing is adapted to all types of soil and is especially applicable on moderately rolling lands. On slightly to medium rolling lands the rows can be run on the line of greatest level of the field, cutting across the terrace bank. Extensive cultivation machinery can be used with perfect satisfaction where this system of terracing is practiced. By its adoption considerable labor will be saved, even though 1-horse implements only be used.

In this system of terracing there is no waste of land. Like all other terrace systems, care must be taken to preserve the terrace when once constructed. Do not break the bank with a turning plow without carefully filling up the furrow afterwards. Fill up all dead furrows that cut the bank.

It takes several years to build up a thoroughly satisfactory terrace bank. With reasonable care the terrace should last for many generations.

Approved:

JAMES WILSON,

Secretary of Agriculture.

WASHINGTON, D. C., *April 6, 1912.*

[Cir. 94.]

ADDITIONAL COPIES of this publication may be procured from the SUPERINTENDENT OF DOCUMENTS, Government Printing Office, Washington, D. C., at 5 cents per copy